The term "thermonuclear star" typically refers to stars that are actively generating energy through **nuclear fusion** in their cores. While "star" is often used broadly to include stellar remnants, the count of active, fusion-powered stars in the Milky Way is estimated to be between **100 billion and 400 billion**.

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Because we are inside the Milky Way, we cannot "see" every star due to interstellar dust and the vast distances involved. Therefore, astronomers calculate this number by measuring the galaxy's total mass and the distribution of different star types.

The Galactic Population Breakdown

In a strict lexical or scientific sense, not every object categorized as a "star" is currently "thermonuclear." Here is how the population is divided:

- **Active Thermonuclear Stars (~90–97%):** These are stars currently in their "Main Sequence" phase (like our Sun) or later stages (Red Giants, Supergiants). They are actively fusing hydrogen into helium or heavier elements.
    - **Red Dwarfs:** These make up the vast majority (about 75%) of the galaxy's stars. They are small, cool, and burn their thermonuclear fuel so slowly they can live for trillions of years.
- **Stellar Remnants (~3–10%):** These are "dead" stars that have ceased thermonuclear fusion.
    - **White Dwarfs:** Roughly **10 billion** objects in our galaxy are white dwarfs. They are the hot, dense cores of dead stars that no longer have fusion reactions.
    - **Neutron Stars and Black Holes:** These are rarer remnants of massive stars that have also finished their thermonuclear cycles.

Why the range is so wide (100–400 Billion)

The uncertainty in the count comes from two main factors:

1. **Mass Estimation:** We estimate the number of stars by determining the galaxy's mass and then subtracting the "dark matter." If we assume the average star is a low-mass Red Dwarf, the count is higher (~400 billion). If we assume a higher average mass, the count is lower (~100 billion).

2. **Dim Stars:** Red dwarfs are so dim that we can only see the ones relatively close to us. Mapping the "unseen" population in the distant spiral arms requires complex statistical modeling.

Comparison of Star Types

Star Category	Thermonuclear Status	Prevalence in Milky Way
Main Sequence (e.g., Sun)	**Active**	~90%
Red Giants	**Active**	~1%
White Dwarfs	**Inactive**	~9%
Neutron Stars / Black Holes	**Inactive**	< 0.1%

Summary: If you are looking for stars that are currently "burning," you are looking at roughly **100 to 400 billion** objects. If you exclude remnants like white dwarfs, you would subtract approximately 10 billion from that total, though the margin of error in the total count is much larger than the number of remnants themselves.